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Model	DS-2
Product:	Digital Synthesizer
Description:	Schematic

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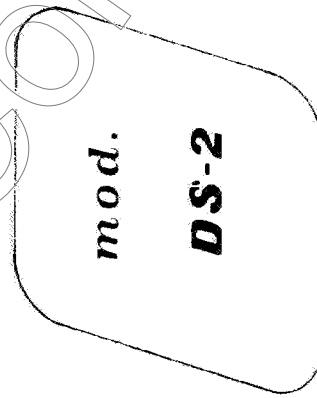
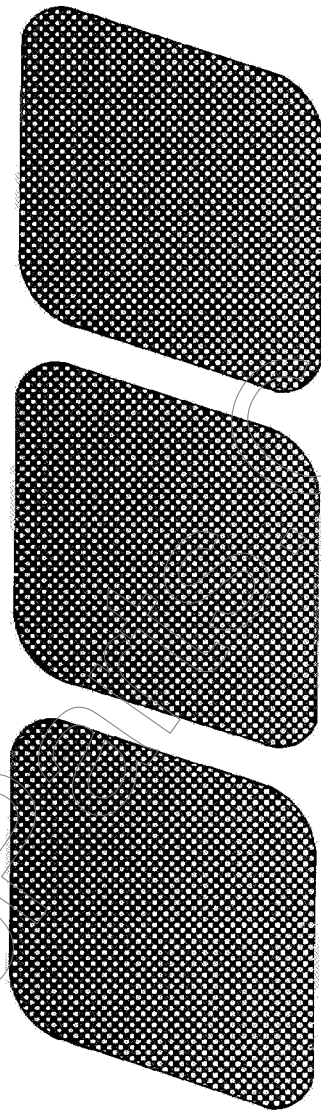
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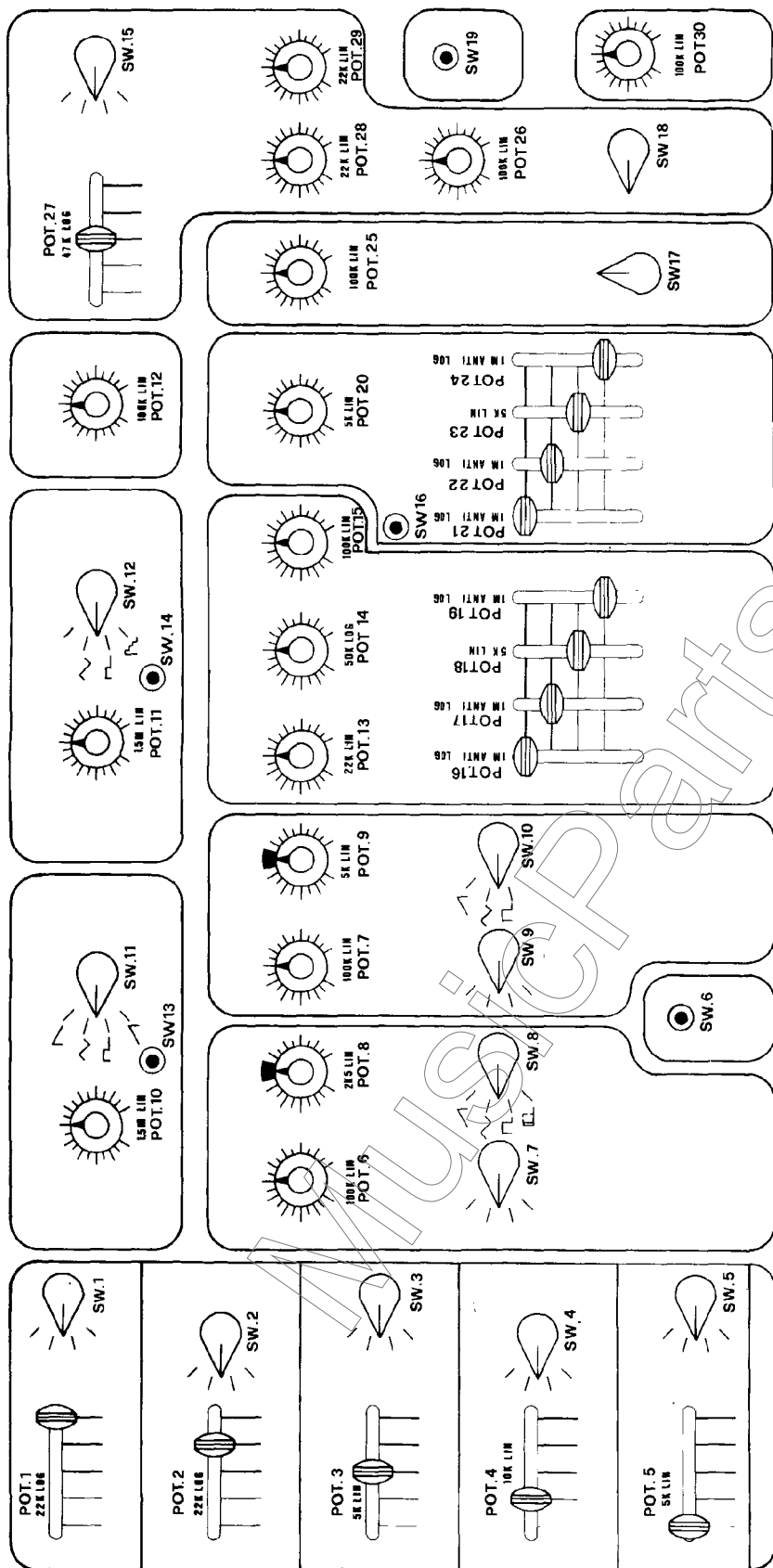
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SCHEMATIC DIAGRAM

CRUMAR[®]

Harvard Instruments



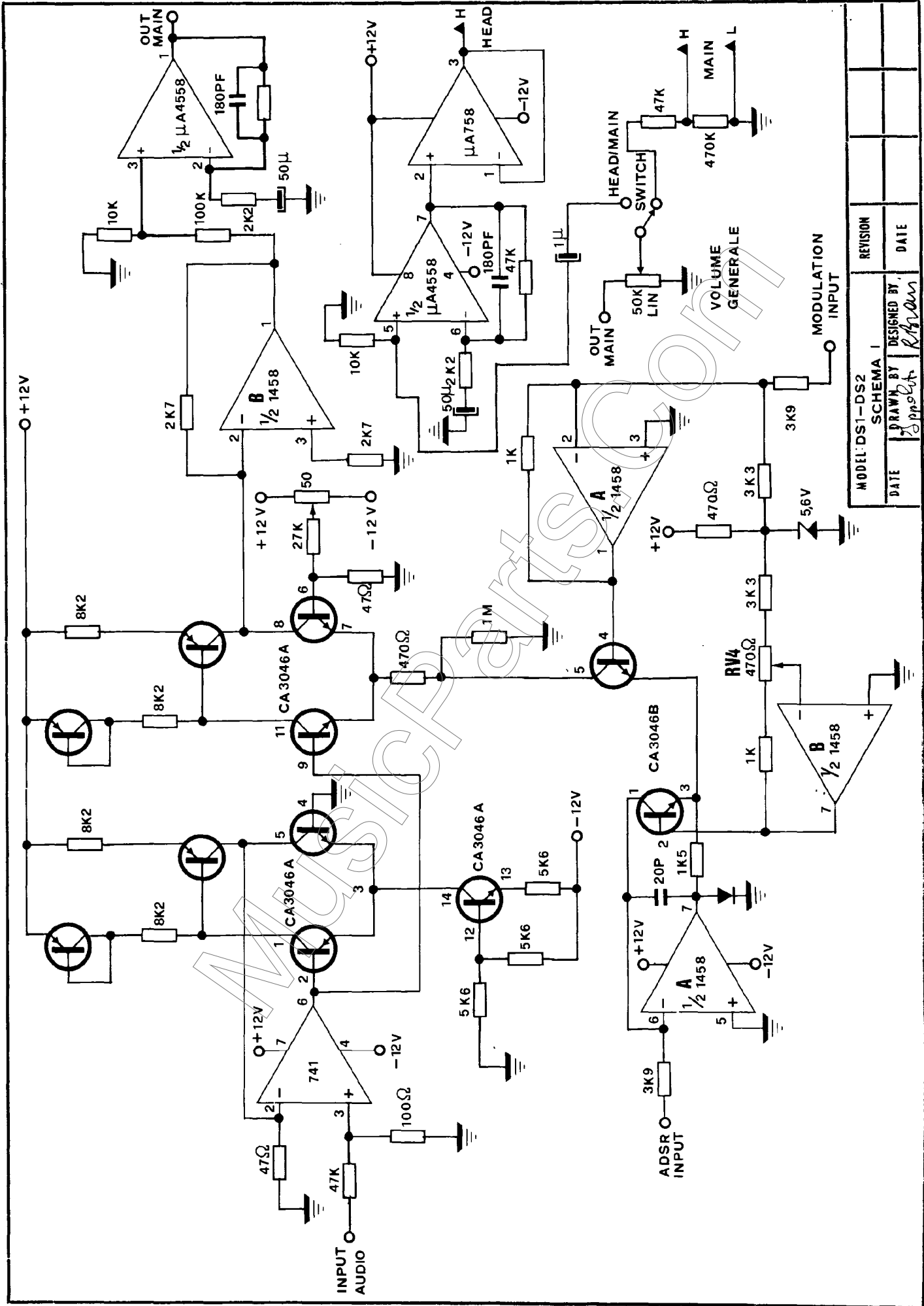


DIGITAL SYNTHESIZER DS2



MODEL DS2	DESIGNED BY	DATE
	27 1-70	
	DESIGNED BY	DATE
	27 1-70	

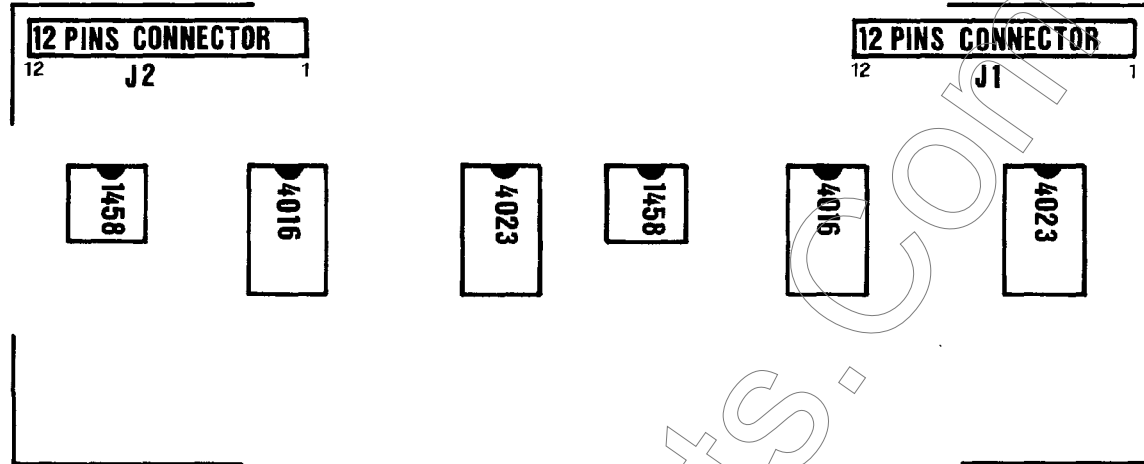
BOARD	INTERMEDIATE CIRCUITS	BOARD	INTERMEDIATE CIRCUITS
P-131	1C1 4003	P-132	1C2 7415
//	1C2 7415	//	1C3 7417A
//	1C3 7417A	//	1C4 7418
P-132	1C5 7418	P-133	1C6 7419
//	1C6 7419	//	1C7 7420
//	1C7 7420	//	1C8 7421
P-133	1C9 7421	P-134	1C10 7422
//	1C10 7422	//	1C11 7423
//	1C11 7423	//	1C12 7424
P-134	1C13 7424	P-135	1C14 7425
//	1C14 7425	//	1C15 7426
//	1C15 7426	//	1C16 7427
P-135	1C17 7427	P-136	1C18 7428
//	1C18 7428	//	1C19 7429
//	1C19 7429	//	1C20 7430
P-136	1C21 7430	P-137	1C22 7431
//	1C22 7431	//	1C23 7432
//	1C23 7432	//	1C24 7433
P-137	1C25 7433	P-138	1C26 7434
//	1C26 7434	//	1C27 7435
//	1C27 7435	//	1C28 7436
P-138	1C29 7436	P-139	1C30 7437
//	1C30 7437	//	1C31 7438
//	1C31 7438	//	1C32 7439
P-139	1C33 7439	P-140	1C34 7440
//	1C34 7440	//	1C35 7441
//	1C35 7441	//	1C36 7442
P-140	1C37 7442	P-141	1C38 7443
//	1C38 7443	//	1C39 7444
//	1C39 7444	//	1C40 7445
P-141	1C41 7445	P-142	1C42 7446
//	1C42 7446	//	1C43 7447
//	1C43 7447	//	1C44 7448
P-142	1C45 7448	P-143	1C46 7449
//	1C46 7449	//	1C47 7450
//	1C47 7450	//	1C48 7451
P-143	1C49 7451	P-144	1C50 7452
//	1C50 7452	//	1C51 7453
//	1C51 7453	//	1C52 7454
P-144	1C53 7454	P-145	1C54 7455
//	1C54 7455	//	1C55 7456
//	1C55 7456	//	1C56 7457
P-145	1C57 7457	P-146	1C58 7458
//	1C58 7458	//	1C59 7459
//	1C59 7459	//	1C60 7460
P-146	1C61 7460	P-147	1C62 7461
//	1C62 7461	//	1C63 7462
//	1C63 7462	//	1C64 7463
P-147	1C65 7463	P-148	1C66 7464
//	1C66 7464	//	1C67 7465
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P-148	1C69 7466	P-149	1C70 7467
//	1C70 7467	//	1C71 7468
//	1C71 7468	//	1C72 7469
P-149	1C73 7469	P-150	1C74 7470
//	1C74 7470	//	1C75 7471
//	1C75 7471	//	1C76 7472
P-150	1C77 7472	P-151	1C78 7473
//	1C78 7473	//	1C79 7474
//	1C79 7474	//	1C80 7475
P-151	1C81 7475	P-152	1C82 7476
//	1C82 7476	//	1C83 7477
//	1C83 7477	//	1C84 7478
P-152	1C85 7478	P-153	1C86 7479
//	1C86 7479	//	1C87 7480
//	1C87 7480	//	1C88 7481
P-153	1C89 7481	P-154	1C90 7482
//	1C90 7482	//	1C91 7483
//	1C91 7483	//	1C92 7484
P-154	1C93 7484	P-155	1C94 7485
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P-155	1C97 7487	P-156	1C98 7488
//	1C98 7488	//	1C99 7489
//	1C99 7489	//	1C100 7490
P-156	1C101 7490	P-157	1C102 7491
//	1C102 7491	//	1C103 7492
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P-157	1C105 7493	P-158	1C106 7494
//	1C106 7494	//	1C107 7495
//	1C107 7495	//	1C108 7496
P-158	1C109 7496	P-159	1C110 7497
//	1C110 7497	//	1C111 7498
//	1C111 7498	//	1C112 7499
P-159	1C113 7499	P-160	1C114 7500
//	1C114 7500	//	1C115 7501
//	1C115 7501	//	1C116 7502
P-160	1C117 7502	P-161	1C118 7503
//	1C118 7503	//	1C119 7504
//	1C119 7504	//	1C120 7505
P-161	1C121 7505	P-162	1C122 7506
//	1C122 7506	//	1C123 7507
//	1C123 7507	//	1C124 7508
P-162	1C125 7508	P-163	1C126 7509
//	1C126 7509	//	1C127 7510
//	1C127 7510	//	1C128 7511
P-163	1C129 7511	P-164	1C130 7512
//	1C130 7512	//	1C131 7513
//	1C131 7513	//	1C132 7514
P-164	1C133 7514	P-165	1C134 7515
//	1C134 7515	//	1C135 7516
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P-165	1C137 7517	P-166	1C138 7518
//	1C138 7518	//	1C139 7519
//	1C139 7519	//	1C140 7520
P-166	1C141 7520	P-167	1C142 7521
//	1C142 7521	//	1C143 7522
//	1C143 7522	//	1C144 7523
P-167	1C145 7523	P-168	1C146 7524
//	1C146 7524	//	1C147 7525
//	1C147 7525	//	1C148 7526
P-168	1C149 7526	P-169	1C150 7527
//	1C150 7527	//	1C151 7528
//	1C151 7528	//	1C152 7529
P-169	1C153 7529	P-170	1C154 7530
//	1C154 7530	//	1C155 7531
//	1C155 7531	//	1C156 7532
P-170	1C157 7532	P-171	1C158 7533
//	1C158 7533	//	1C159 7534
//	1C159 7534	//	1C160 7535
P-171	1C161 7535	P-172	1C162 7536
//	1C162 7536	//	1C163 7537
//	1C163 7537	//	1C164 7538
P-172	1C165 7538	P-173	1C166 7539
//	1C166 7539	//	1C167 7540
//	1C167 7540	//	1C168 7541
P-173	1C169 7541	P-174	1C170 7542
//	1C170 7542	//	1C171 7543
//	1C171 7543	//	1C172 7544
P-174	1C173 7544	P-175	1C174 7545
//	1C174 7545	//	1C175 7546
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P-175	1C177 7547	P-176	1C178 7548
//	1C178 7548	//	1C179 7549
//	1C179 7549	//	1C180 7550
P-176	1C181 7550	P-177	1C182 7551
//	1C182 7551	//	1C183 7552
//	1C183 7552	//	1C184 7553
P-177	1C185 7553	P-178	1C186 7554
//	1C186 7554	//	1C187 7555
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P-178	1C189 7556	P-179	1C190 7557
//	1C190 7557	//	1C191 7558
//	1C191 7558	//	1C192 7559
P-179	1C193 7559	P-180	1C194 7560
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P-180	1C197 7562	P-181	1C198 7563
//	1C198 7563	//	1C199 7564
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P-181	1C201 7565	P-182	1C202 7566
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P-182	1C205 7568	P-183	1C206 7569
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P-183	1C209 7571	P-184	1C210 7572
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P-184	1C213 7574	P-185	1C214 7575
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P-185	1C217 7577	P-186	1C218 7578
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P-186	1C221 7580	P-187	1C222 7581
//	1C222 7581	//	1C223 7582
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P-187	1C225 7583	P-188	1C226 7584
//	1C226 7584	//	1C227 7585
//	1C227 7585	//	1C228 7586
P-188	1C229 7586	P-189	1C230 7587
//	1C230 7587	//	1C231 7588
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P-189	1C233 7589	P-190	1C234 7590
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P-190	1C237 7592	P-191	1C238 7593
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P-191	1C241 7595	P-192	1C242 7596
//	1C242 7596	//	1C243 7597
//	1C243 7597	//	1C244 7598
P-192	1C245 7598	P-193	1C246 7599
//	1C246 7599	//	1C247 7600
//	1C247 7600	//	1C248 7601
P-193	1C249 7601	P-194	1C250 7602
//	1C250 7602	//	1C251 7603
//	1C251 7603	//	1C252 7604
P-194	1C253 7604	P-195	1C254 7605
//	1C254 7605	//	1C255 7606
//	1C255 7606	//	1C256 7607
P-195	1C257 7607	P-196	1C258 7608
//	1C258 7608	//	1C259 7609
//	1C259 7609	//	1C260 7610
P-196	1C261 7610	P-197	1C262 7611
//	1C262 7611	//	1C263 7612
//	1C263 7612	//	1C264 7613
P-197	1C265 7613	P-198	1C266 7614
//	1C266 7614	//	1C267 7615
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P-198	1C269 7616	P-199	1C270 7617
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//	1C271 7618	//	1C272 7619
P-199	1C273 7619	P-200	1C274 7620
//	1C274 7620	//	1C275 7621
//	1C275 7621	//	1C276 7622
P-200	1C277 7622	P-201	1C278 7623
//	1C278 7623	//	1C279 7624
//	1C279 7624	//	1C280 7625
P-201	1C281 7625	P-202	1C282 7626
//	1C282 7626	//	1C283 7627
//	1C283 7627	//	1C284 7628
P-202	1C285 7628	P-203	1C286 7629
//	1C286 7629	//	1C287 7630
//	1C287 7630	//	1C288 7631
P-203	1C289 7631	P-204	1C290 7632
//	1C290 7632	//	1C291 7633
//	1C291 7633	//	1C292 7634
P-204	1C293 7634	P-205	1C294 7635
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//	1C295 7636	//	1C296 7637
P-205	1C297 7637	P-206	1C298 7638
//	1C298 7638	//	1C299 7639
//	1C299 7639	//	1C300 7640
P-206	1C301 7640	P-207	1C302 7641
//	1C302 7641	//	1C303 7642
//	1C303 7642	//	1C304 7643
P-207	1C305 7643	P-208	1C306 7644
//	1C306 7644	//	1C307 7645
//	1C307 7645	//	1C308 7646
P-208	1C309 7646	P-209	1C310 7647
//	1C310 7647	//	1C311 7648
//	1C311 7648	//	1C312 7649
P-209	1C313 7649	P-210	1C314 7650
//	1C314 7650	//	1C315 7651
//	1C315 7651	//	1C316 7652
P-210	1C317 7652	P-211	1C318 7653
//	1C318 7653	//	1C319 7654
//	1C319 7654	//	1C320 7655
P-211	1C321 7655	P-212	1C322 7656
//	1C322 7656	//	1C323 7657
//	1C323 7657	//	1C324 7658
P-212	1C325 7658	P-213	1C326 7659
//	1C326 7659	//	1C327 7660
//	1C327 7660	//	1C328 7661
P-213	1C329 7661	P-214	1C330 7662
//	1C330 7662	//	1C331 7663
//	1C331 7663	//	1C332 7664
P-214	1C333 7664	P-215	1C334 7665
//	1C334 7665	//	1C335 7666
//	1C335 7666	//	1C336 7667
P-215	1C337 7667	P-216	1C338 7668
//	1C338 7668	//	1C339 7669
//	1C339 7669	//	1C340 7670
P-216	1C341 7670	P-217	1C342 7671
//			



MODEL DS1-DS2	REVISION
SCHEMA 1	
DRAWN BY	DESIGNED BY
DATE	DATE

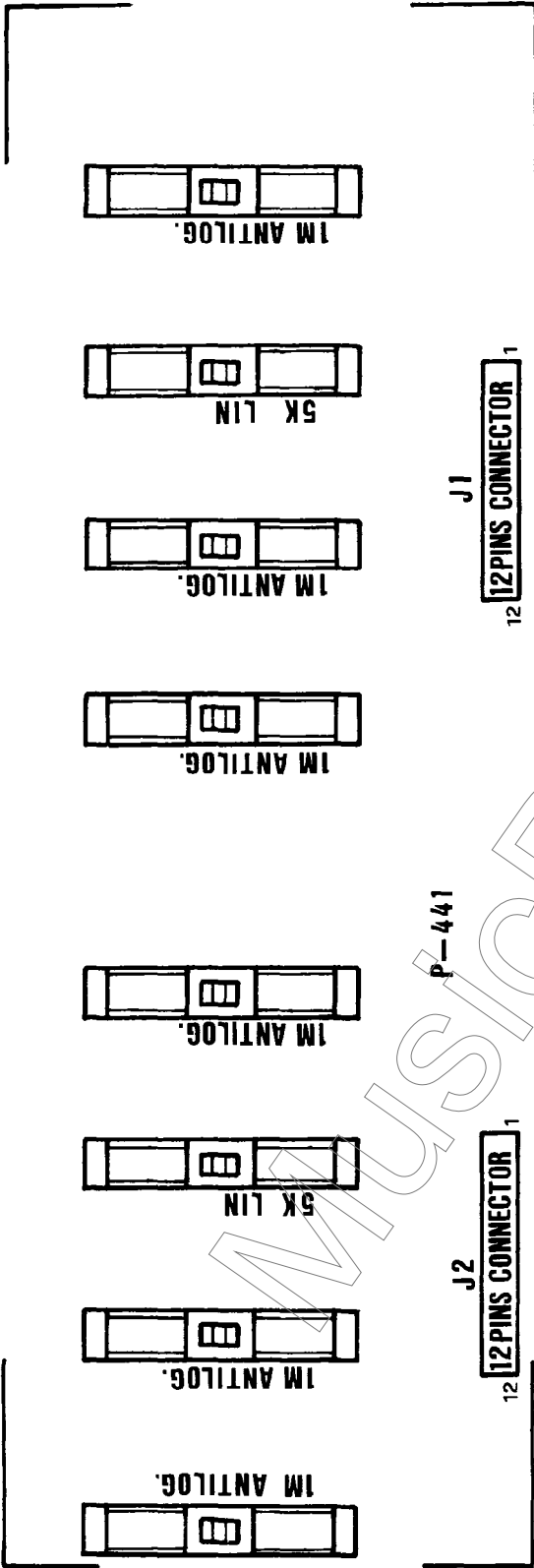
PIN	REFERENCE J1	PIN	REFERENCE J2	PIN	REFERENCE J3
1	-5.6V	1-2	GND	1	ADSR VCA
2	CUTOFF POT	3	RESON CNTR.	2	MODULAT INPUT
3	GND	4	POLY	3	-12V
4	MODULAT INPUT	5	NOISE	4	+12V
5	ADSR VCF	6	OSC 1	5	GND
6	KT SW TA	7	OSC 2	6	GND
7	RESONANCE LAT.	8		7	OUT VOL GEN
8	GND			8	INPUT HEAD PH
				9	GND
				10	OUT HEAD PH

P. 440



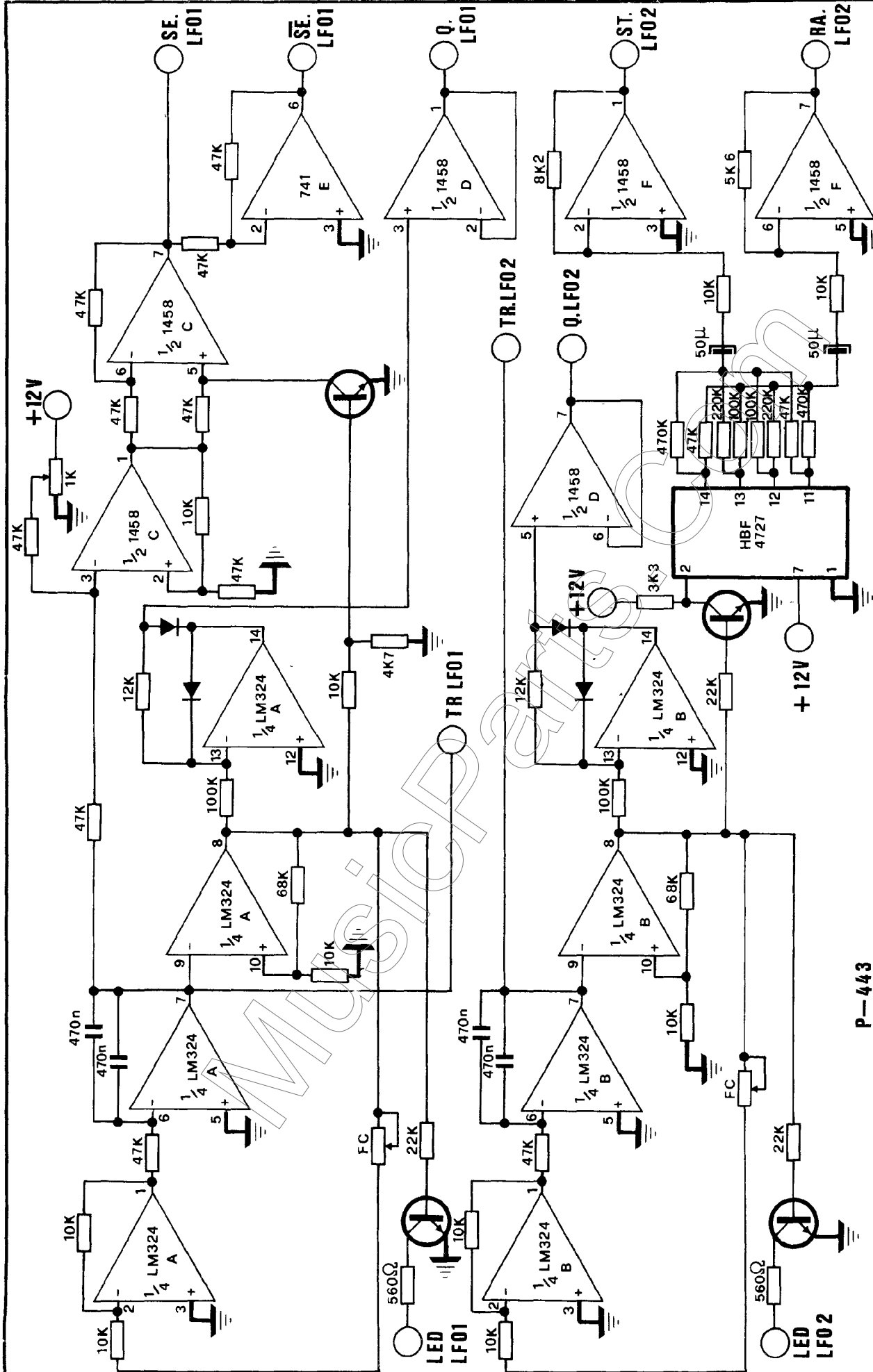
PIN	REFERENCE J1	PIN	REFERENCE J2
1	+12V	1	OUT ADSR VCF
2	-12V	2	
3	R POT	3	
4	S POT	4	+5V
5	GND	5	R POT
6	GND	6	S POT
7	GND	7	GND
8	GND	8	GND
9	D POT	9	GND
10	A POT	10	GND
11	GATE	11	D POT
12	OUT ADSR VCA	12	A POT

MODEL DS DS			REVISION				
SCHEMA L							
DATE	DRAWN BY	DESIGNED BY	DATE				
	<i>Appel</i>	<i>R. Kuan</i>					



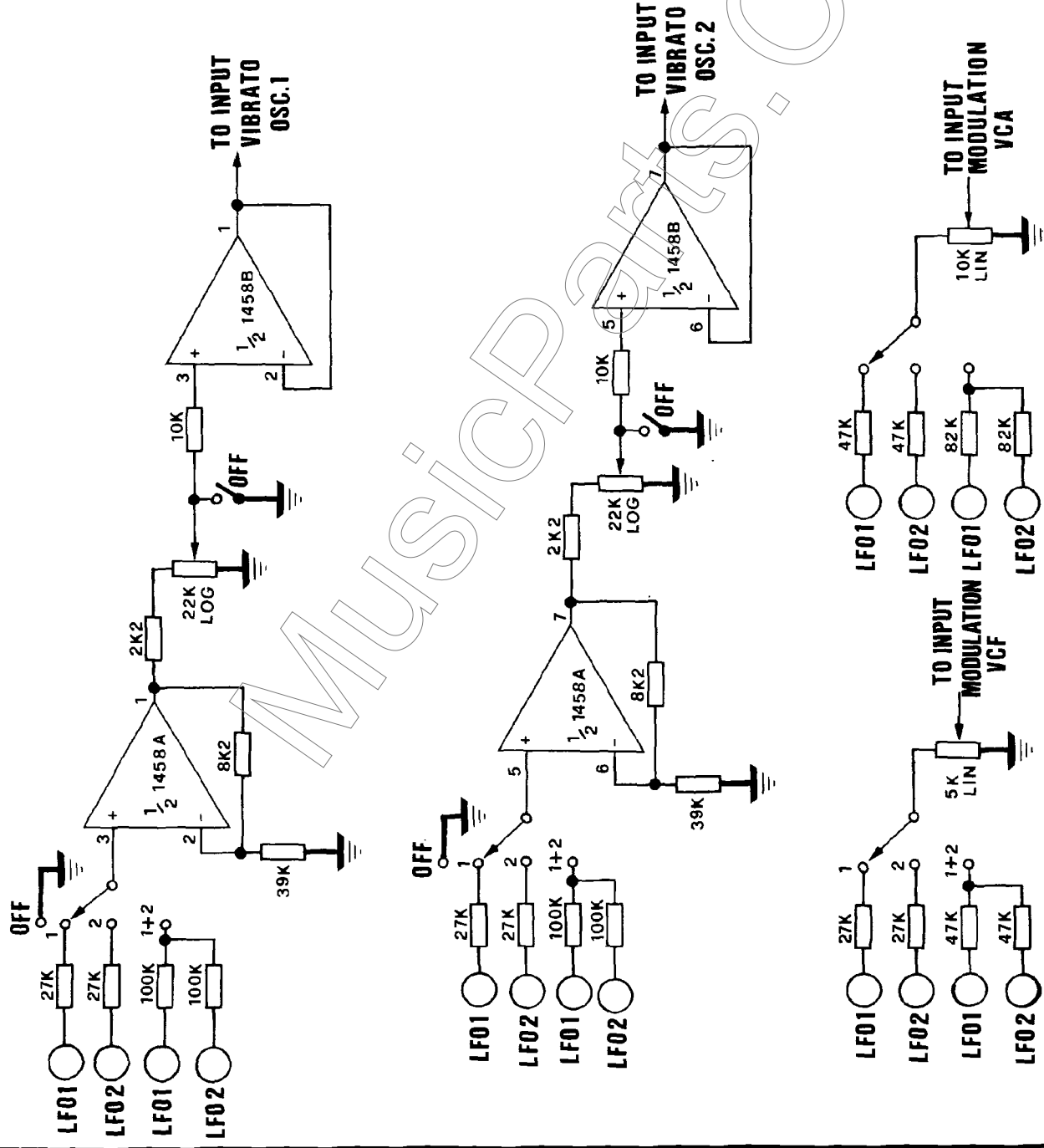
PIN	REFERENCE J2	PIN	REFERENCE J1
1	OUT ADSR VCF	1	+12V
2	" " "	2	-12V
3	" " "	3	R POT.
4	+5V	4	S POT.
5	R POT.	5	GND
6	S POT.	6	"
7	GND	7	"
8	"	8	"
9	"	9	D POT.
10	"	10	A POT.
11	D POT.	11	GATE
12	A POT.	12	OUT ADSR VCA

MODEL	DS2	SCHEMA	REVISION	DATE
DATE	DRAWN BY	DESIGNED BY	DATE	
	Baldwin	Baldwin		



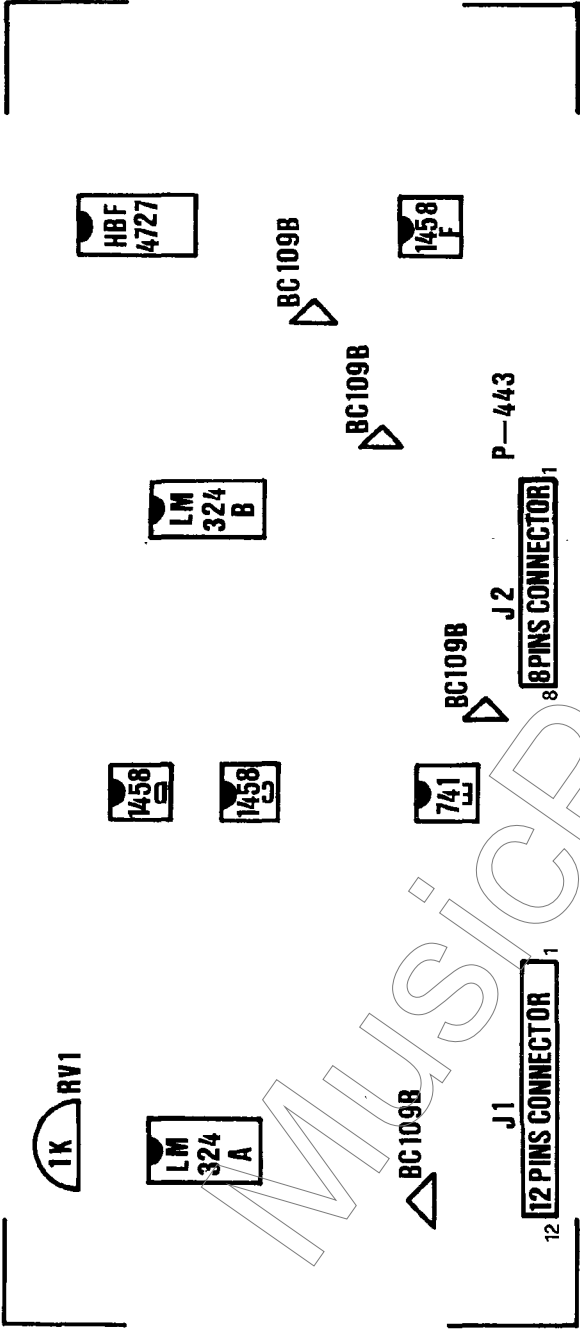
P-443

MODEL DS2 SCHEMAN		REVISION	
DATE	DRAWN BY	DESIGNED BY	DATE
	Bordis	R. R. R.	



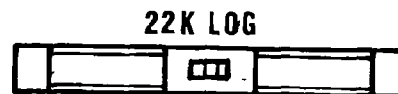
P-445

MODEL	DS2	SCHEMA	M	REVISION	DATE
DATE	DRAWN BY	DESIGNED BY			
	Bonnie G	R Brown			



PIN	REFERENCE J1	PIN	REFERENCE J2
1	SE. LF01	1	STAIRCASE
2	SE. LF01	2	"
3	QUADRA LF01	3	Se H
4	FC LF01	4	LED LF02
5	-12V	5	FC LF0 2
6	TRI. LF01	6	QUADRA LF0 2
7	GND	7	TRI. LF0 2
8	"	8	FC LF02
9	"		
10	LED LF01		
11	FC LF01		
12	+12V		

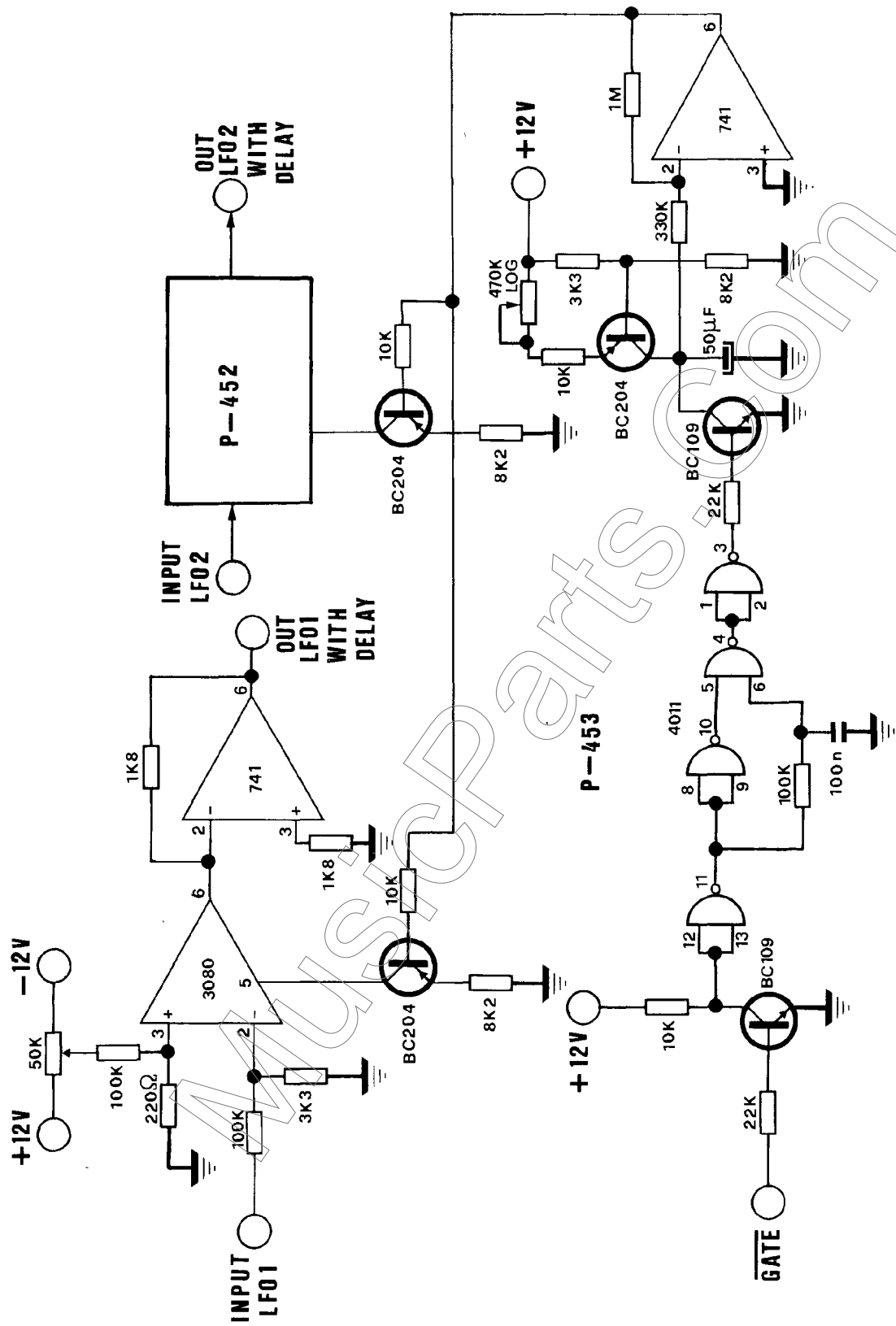
MODEL	DS2	SCHEMA N	REVISION	
DATE	DRAWN BY	DESIGNED BY	DATE	
	Pondar: 6.	R. B. van		



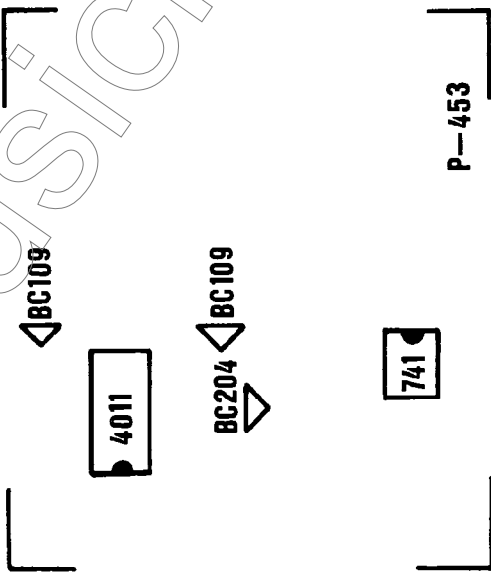
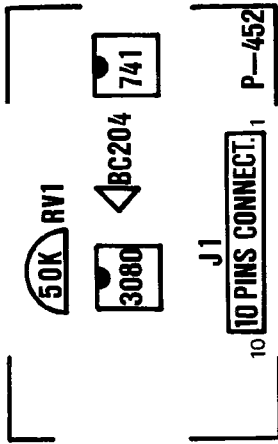
P-445



MODEL	DS2	SCHEMA	M	REVISION			
DATE	DRAWN BY	DESIGNED BY	DATE				
	Borden G.	R. Brown					

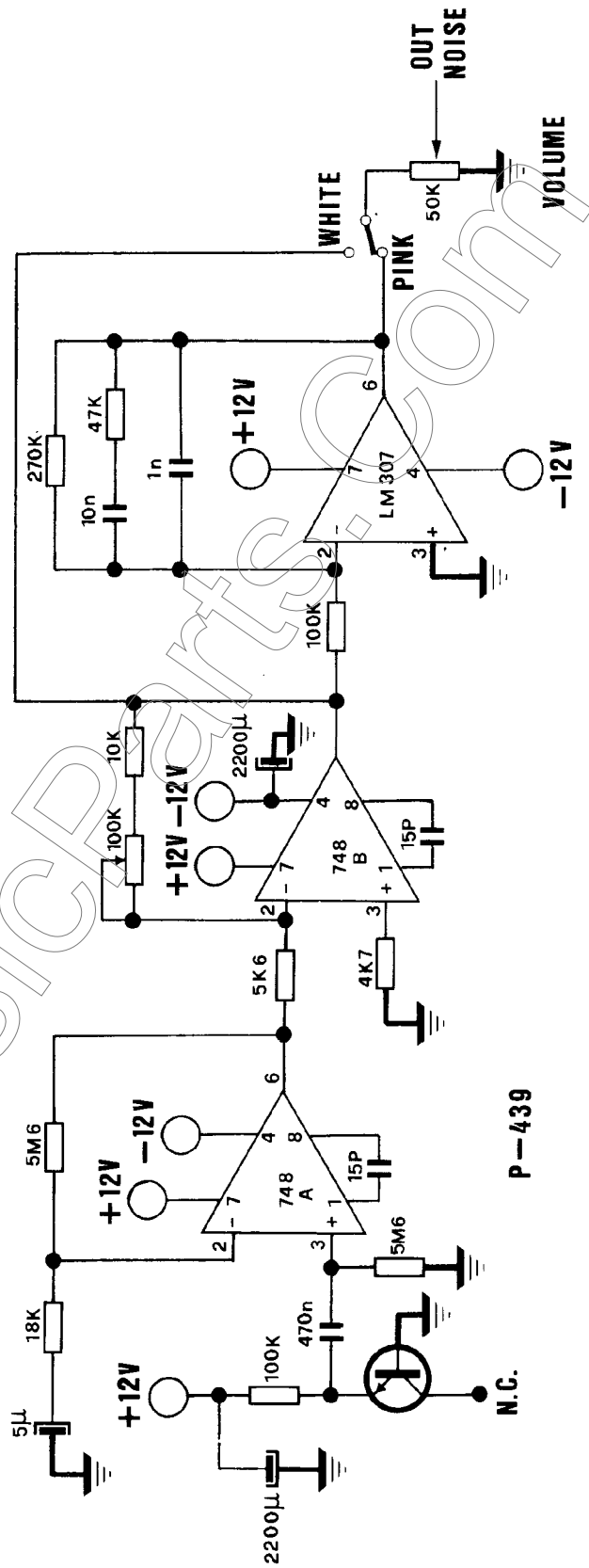
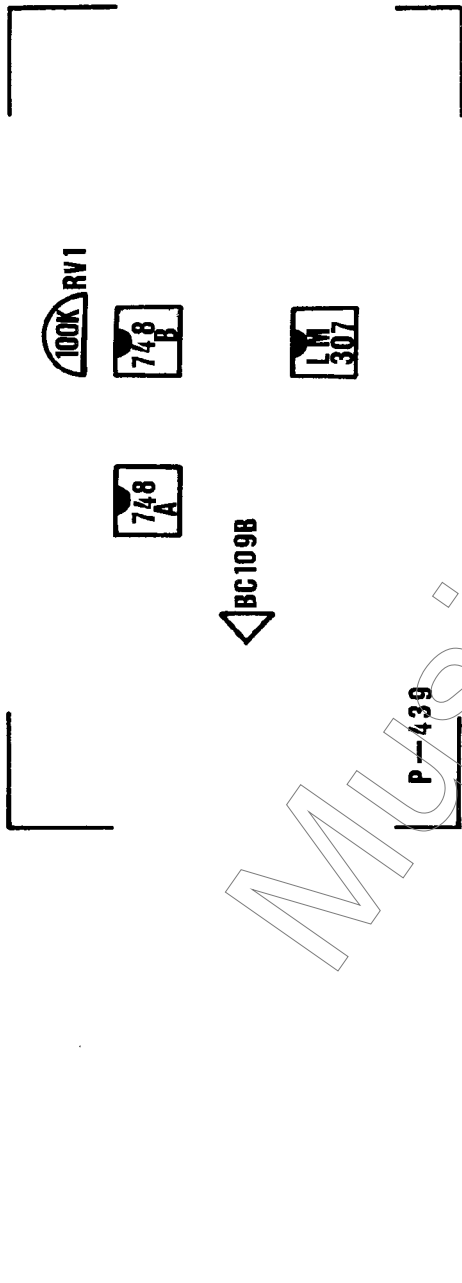


MODEL	DS2	SCHEMA Q	REVISION
DATE	DRAWN BY	DESIGNED BY	DATE
		Bondar: G. R. Bondar	

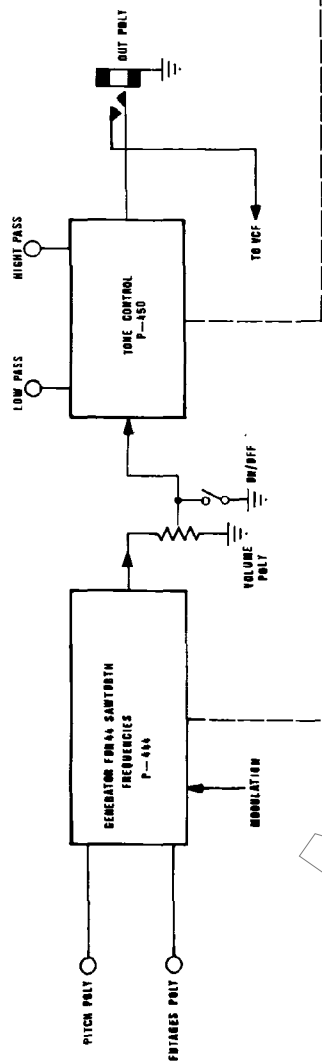


PIN	REFERENCE	J1
1	+12V	
2	OUT LF01 or LF02 WITH DELAY	
3	PIN 6 741	
4	-12V	
5	GND	
6		
7		
8	INP. LF01 or LF02	
9		
10		

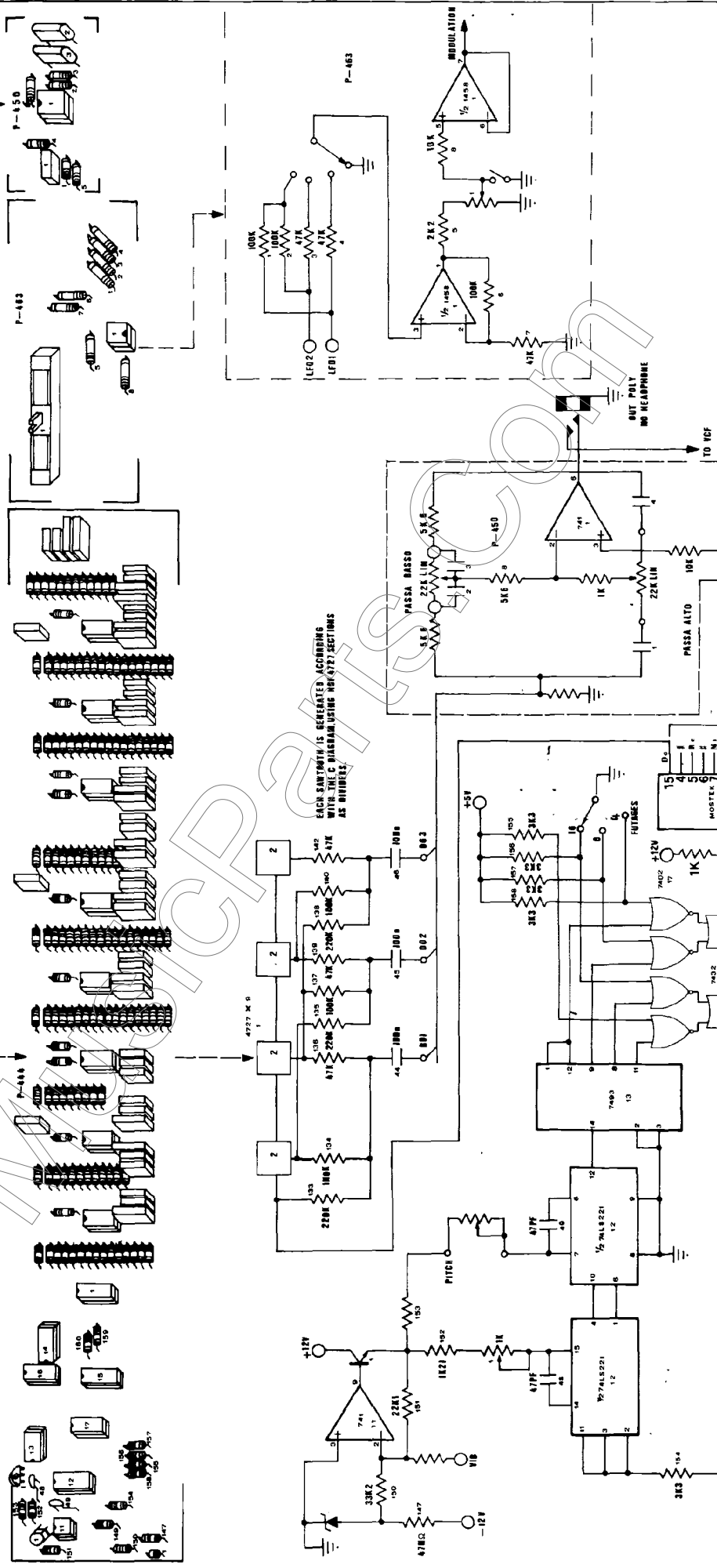
MODEL	DS2	SCHEMA	Q	REVISION	
DATE	DRAWN BY	DESIGNED BY	DATE		
	Bodanig	R. B. B. B.			



MODEL	DS2	SCHEMA	O	REVISION	DATE
DATE	DRAWN BY	DESIGNED BY			
	Borden 6	R. Brown			

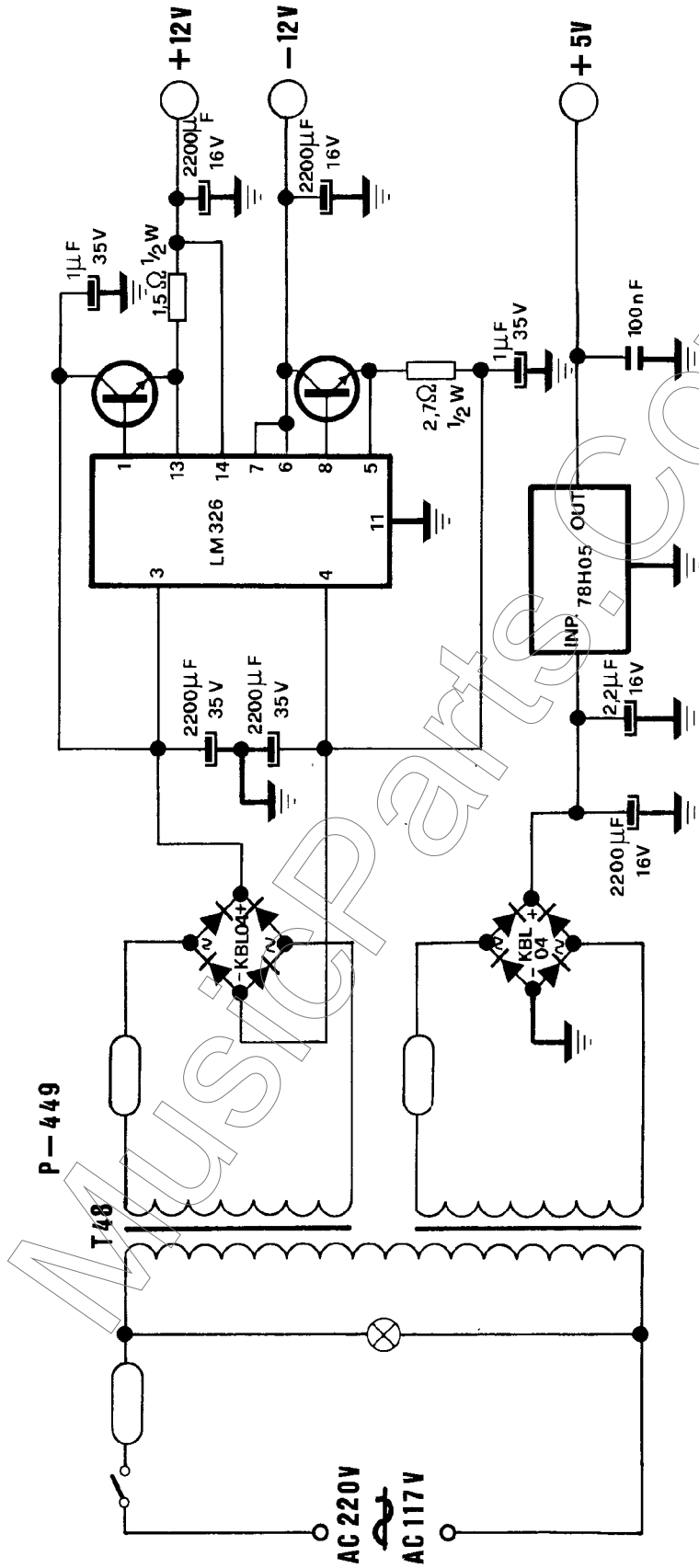


EACH SAWTOOTH IS GENERATED ACCORDING WITH THE C DIAGRAM USING NR477 SECTIONS AS INDICATED



MODEL	DS?	SCHEMA	R	REVISION
DATA	27	1	78	DATE
DRAWN BY	f Gordon R. Borden			

DWG 16



P-449

T48

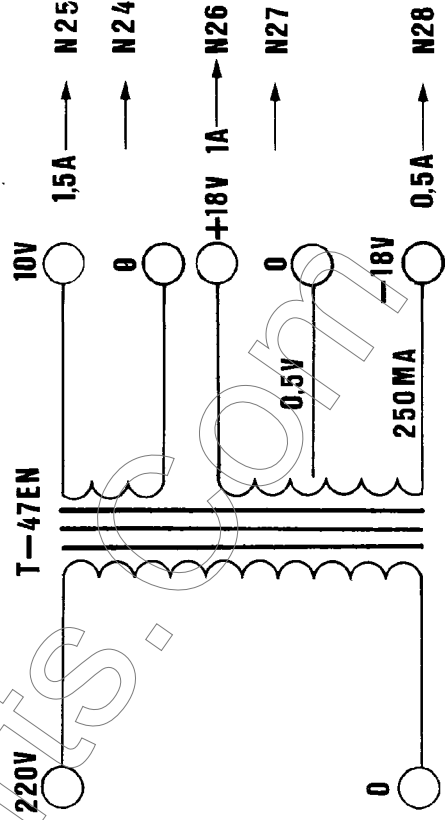
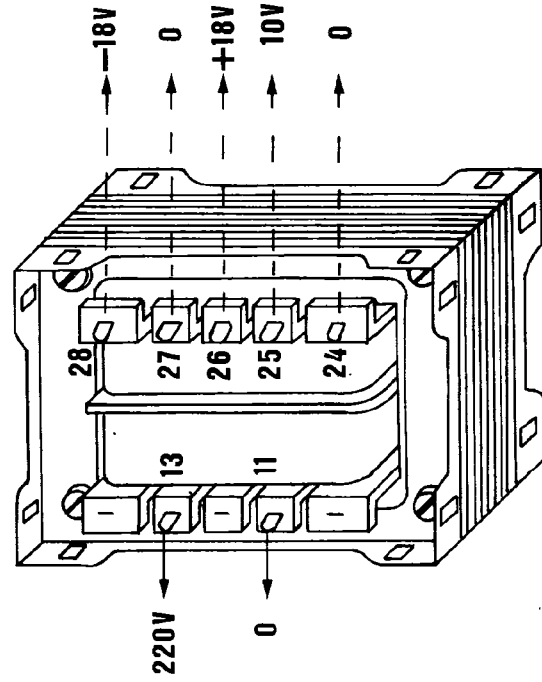
AC 220V

AC 117V

MODEL DS 2 SCHEMA P		REVISION			
DATE	DRAWN BY	DESIGNED BY	DATE		
	Rondan	Rondan			

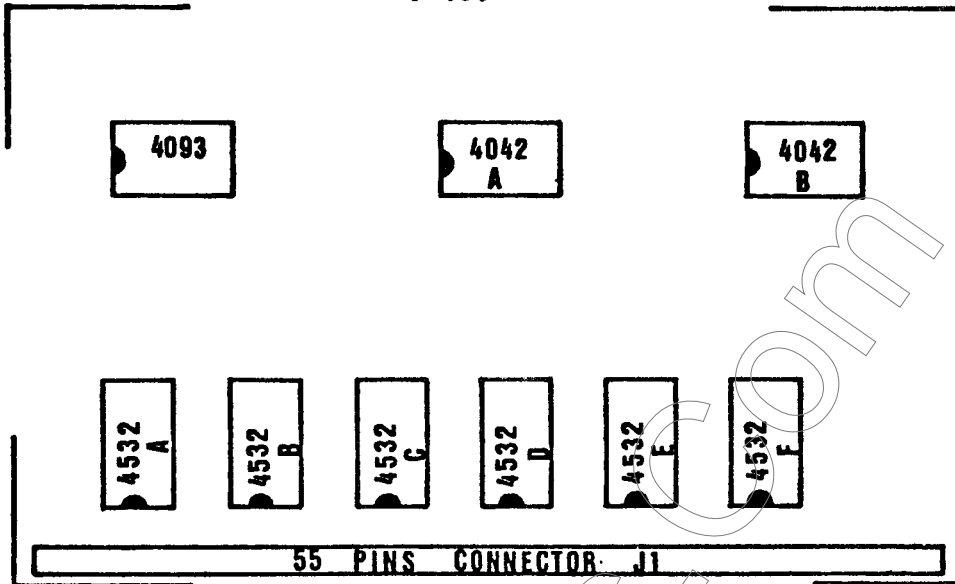


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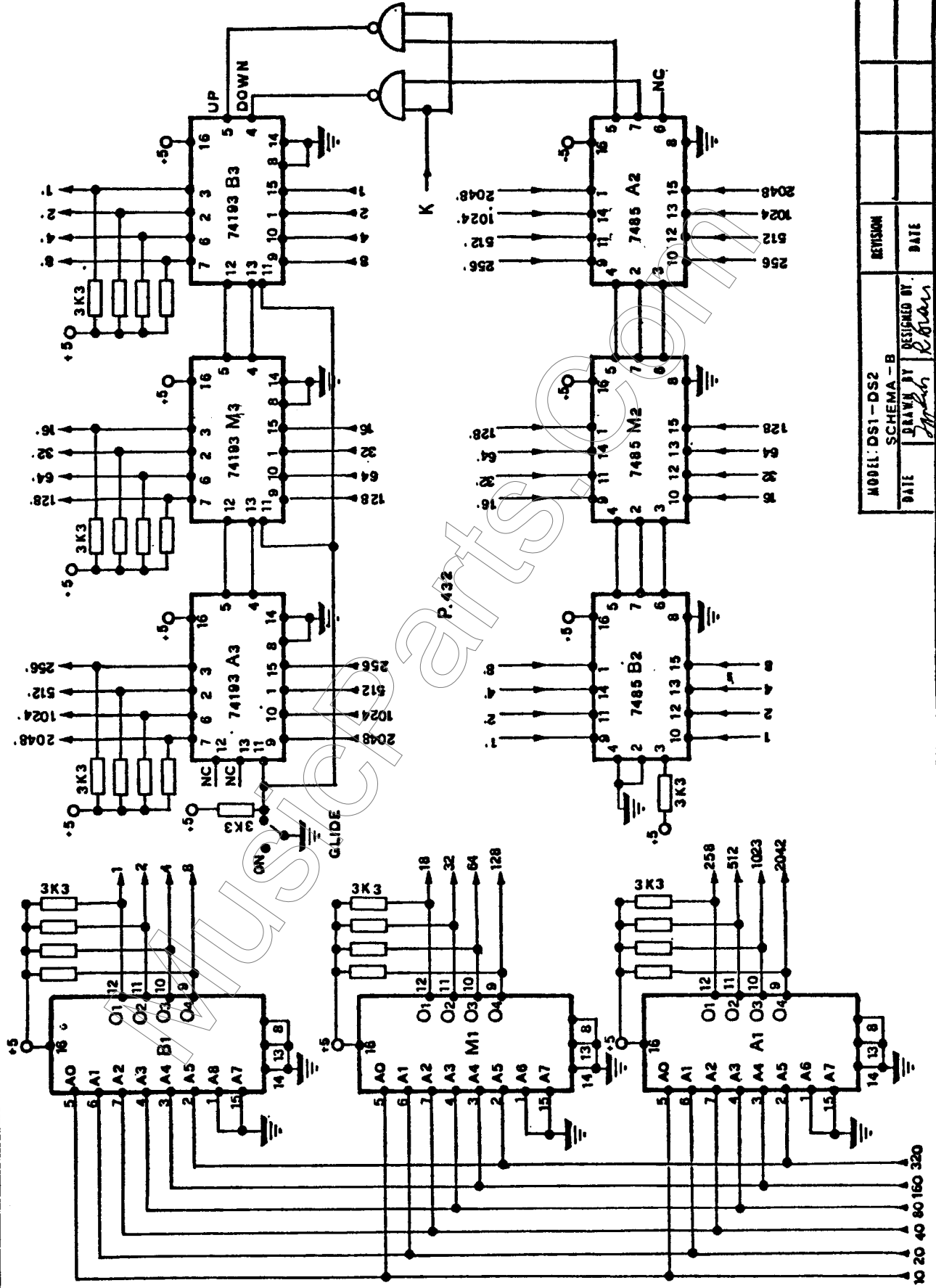
MODEL	DS 2	SCHEMA	P	REVISION	
DATE		DRAWN BY	DESIGNED BY	DATE	
		Borben-G.	R. Bran		

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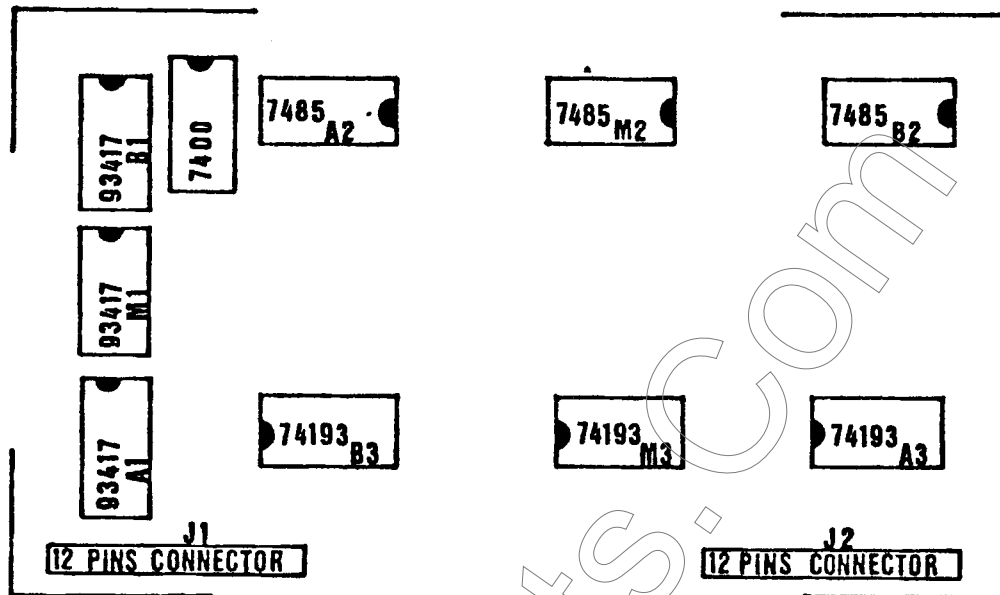
PIN	REFERENCE J 1	PIN	REFERENCE J 1
1	Fa	28	Sol#
2	Fa#	29	La
3	Sol	30	La#
4	Sol#	31	Si
5	La	32	Do
6	La#	33	Do#
7	Si	34	Re
8	Do	35	Re#
9	Do#	36	Mi
10	Re	37	Fa
11	Re#	38	Fa#
12	Mi	39	Sol
13	Fa	40	Sol#
14	Fa#	41	La
15	Sol	42	La#
16	Sol#	43	Si
17	La	44	Do
18	La#	45	+5V
19	Si	46	GND
20	Do	47	1o
21	Do#	48	2o
22	Re	49	4o
23	Re#	50	8o
24	Mi	51	16o
25	Fa	52	32o
26	Fa#	53	+5V
27	Sol	54	GND
		55	GATE NEG

MODEL DS1 DS2 SCHEMA A			REVISION			
DATE	DRAWN BY	DESIGNED BY	DATE			
	<i>D. Smith</i>	<i>R. Smith</i>				



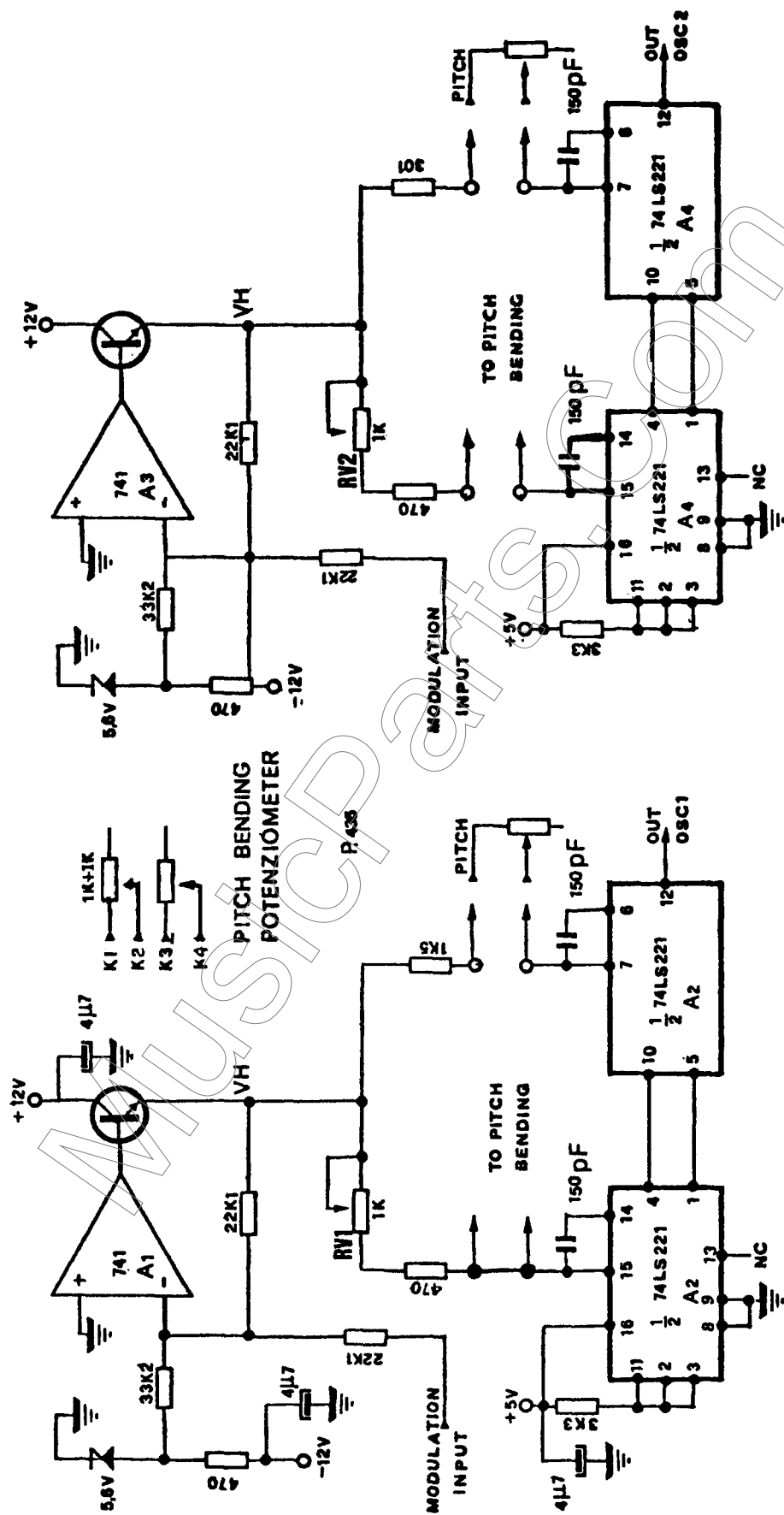
MODEL: DS1-DS2		REVISION	
SCHEMA - B		DESIGNED BY	
DATE		DRAWN BY	K. Khan
		DATE	

P 432



PIN	REFERENCE J1	PIN	REFERENCE J2
1	1o	1	2048'
2	2o	2	1024'
3	4o	3	512'
4	8o	4	256'
5	16o	5	128'
6	32o	6	64'
7	GND	7	32'
8	GND	8	16'
9	+5V	9	8'
10	K	10	4'
11	PORT SW	11	2'
12		12	1'

MODEL DS1 DS2			REVISION		
SCHEMA B					
DATE	DRAWN BY	DESIGNED BY	DATE		
	<i>Y. Chen</i>	<i>R. Brown</i>			

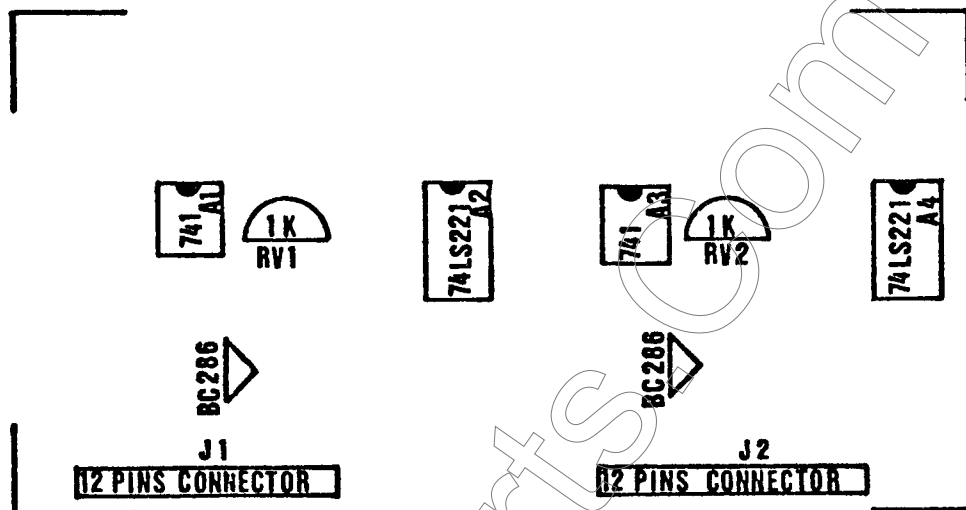


OSCILLATOR 2

OSCILLATOR 1

MODEL: DS1-DS2	REVISION				
SCHEMA-C	DESIGNED BY	DATE			
DATE	DESIGNED BY	DATE			
	DESIGNED BY	DATE			

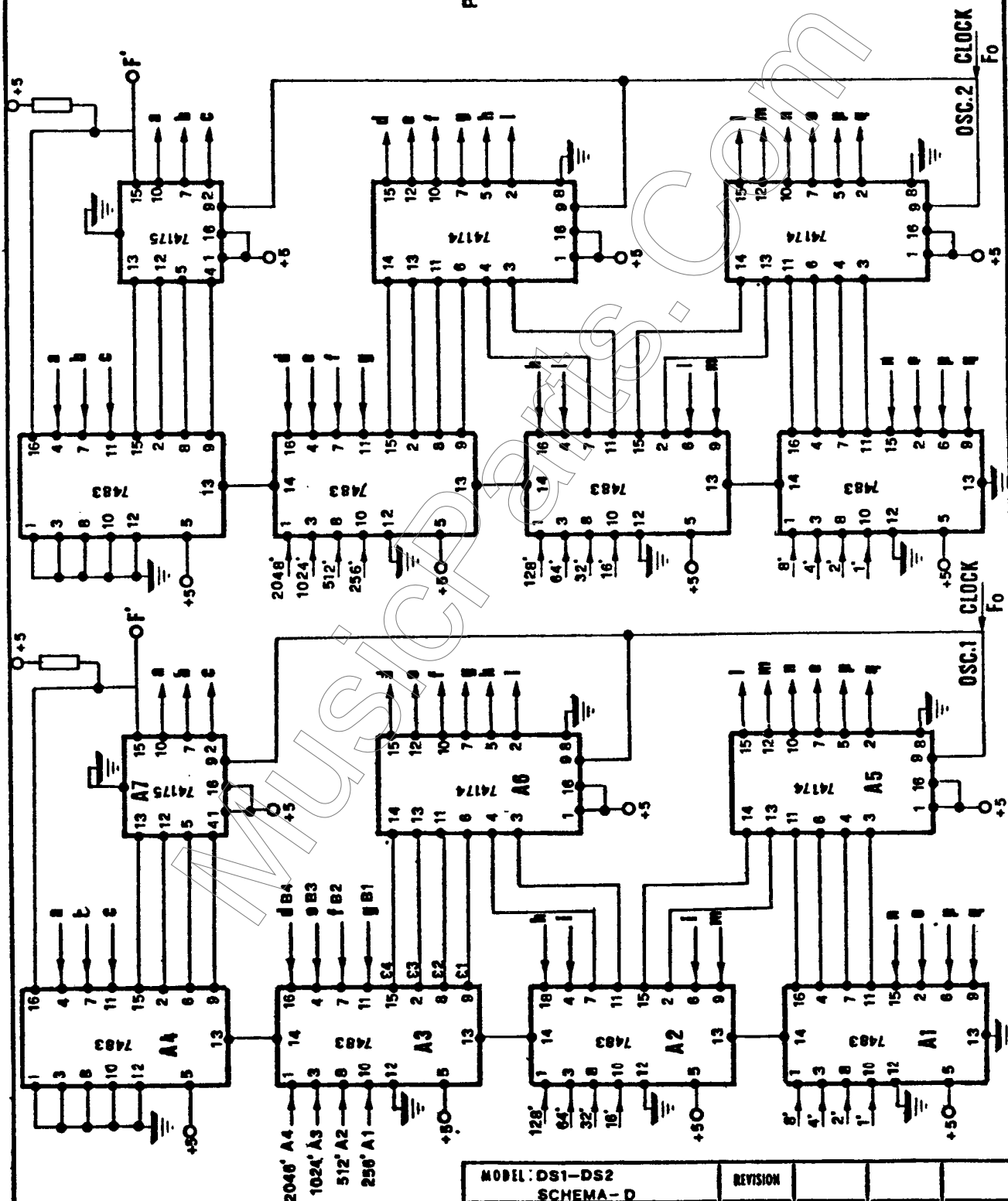
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PIN	REFERENCE J1	PIN	REFERENCE J2
1	GND	1	GND
2	GND	2	GND
3	GND	3	GND
4	-12V	4	-12V
5	MOD INPUT	5	MOD INPUT
6	+12V	6	+12V
7	K1	7	K3
8	K2	8	K4
9	+5V	9	+5V
10	OSC1 OUT	10	OSC2 OUT
11	PITCH	11	PITCH
12	PITCH	12	PITCH

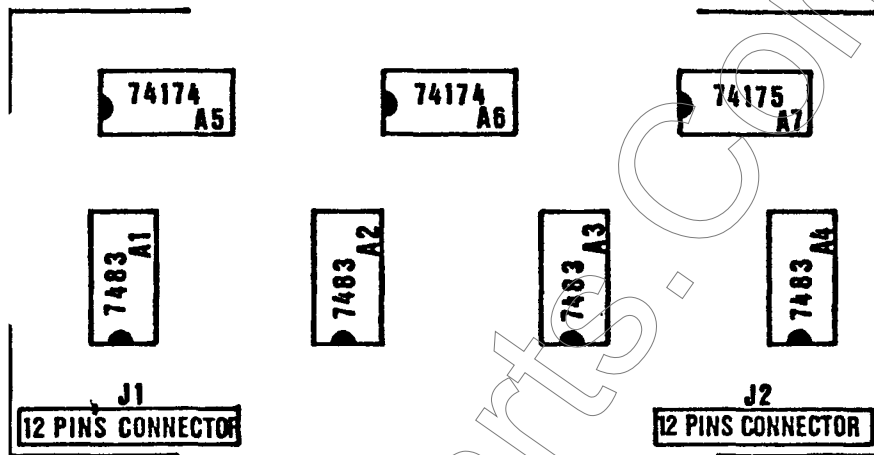
MODEL DS DS	SCHEMA C	REVISION			
DATE	DRAWN BY <i>Ryan</i>	DESIGNED BY <i>Rbran</i>	DATE		

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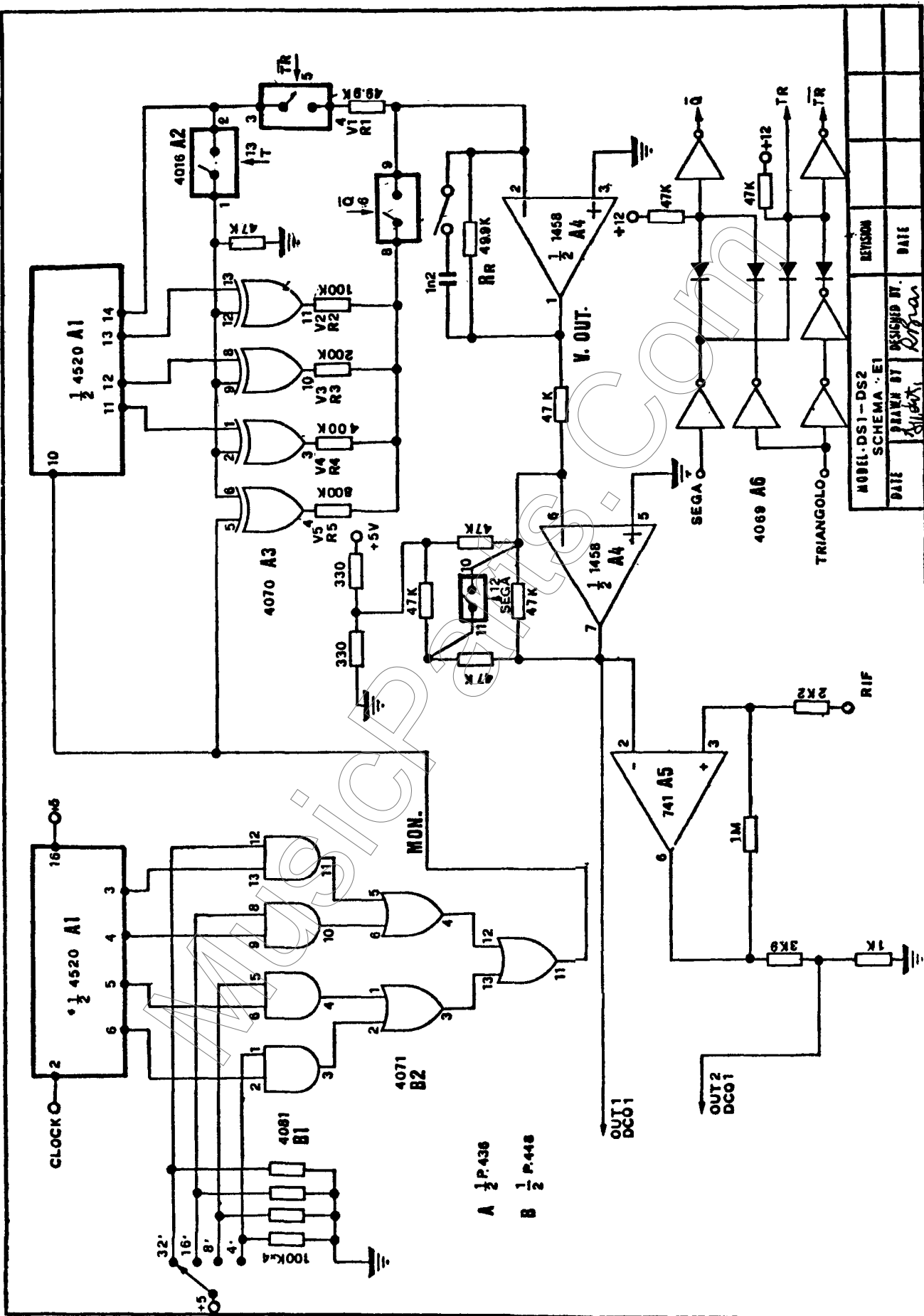
MODEL: DS1-DS2		REVISION	
SCHEMA - D			
DATE	DRAWN BY	DESIGNED BY	DATE
	spoon	R. Brant	

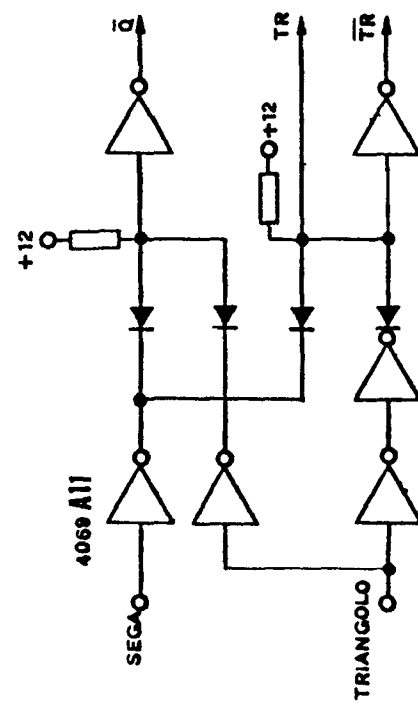
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PIN	REFERENCE	J1	PIN	REFERENCE	J2
1	1'		1	+5V	
2	2'		2	+5V	
3	4'		3	GND	
4	8'		4	GND	
5	16'		5	CLOCK F ₀	
6	32'		6	CLOCK F ₀	
7	64'		7	GND	
8	128'		8	GND	
9	256'		9	OUT F'	
10	512'		10	OUT F'	
11	1024'		11	NC	
12	2048'		12	NC	

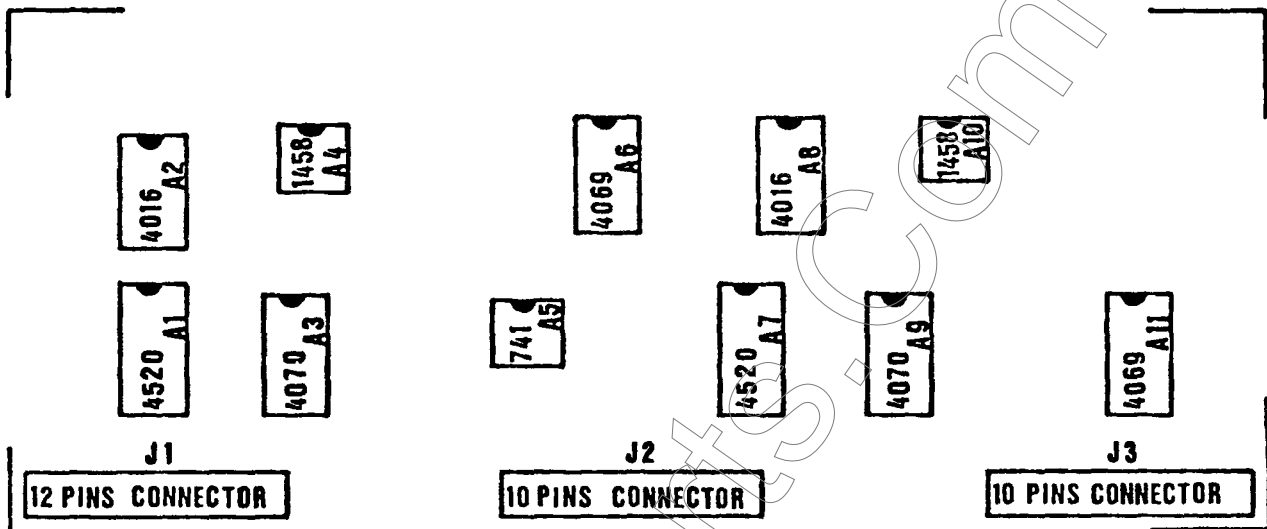
MODEL DS1 DS2	REVISION			
SCHEMA D	DATE			
DRAWN BY	DESIGNED BY	DATE		
<i>R. Brown</i>	<i>R. Brown</i>			





MODEL DS1 - DS2 SCHEMA-E2		REVISION		
DATE	DRAWN BY <i>Wm. J. ...</i>	DESIGNED BY <i>P. J. ...</i>	DATE	

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PIN	REFERENCE J1	PIN	REFERENCE J2	PIN	REFERENCE J3
1	COND	1	V. RIF	1	MON OSC2
2	COND	2	OUT1 DC01	2	SEGA
3	F' OSC1	3	OUT2 DC01	3	GND
4	4' FUTAGES	4	SEGA WAVEF SW	4	GND
5	8' SW	5	TRIAN OSC 1	5	GND
6	16' OSC 1	6	F' OSC1	6	GND
7	32' OSC 1	7	4' FUTAGES	7	GND
8	GND	8	8' SW	8	GND
9	MON OSC1	9	16' OSC 1	9	TRIANG
10	+5V	10	32'	10	OUT DC02
11	+12V				
12	-12V				

↓
WAVEF
SW
OSC 1
↑

MODEL DS1 DS2			REVISION			
SCHEMA F						
DATE	DRAWN BY	DESIGNED BY	DATE			
	<i>[Signature]</i>	<i>[Signature]</i>				

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J1

12 PINS CONNECTOR

J2

10 PINS CONNECTOR

J3

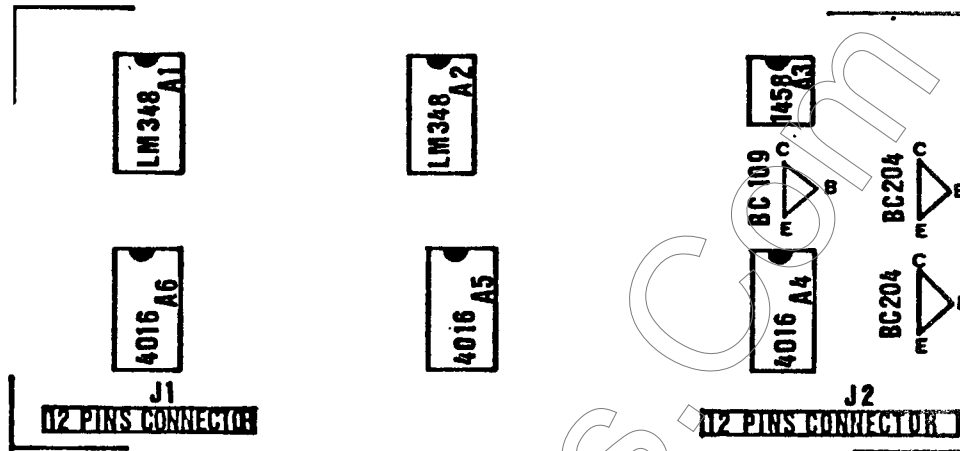
10 PINS CONNECTOR

PIN	REFERENCE J1	PIN	REFERENCE J2	PIN	REFERENCE J3
1	COND	1	V. RIF	1	MON OSC2
2	COND	2	OUT1 DCO1	2	SEGA
3	F' OSC1	3	OUT2 DCO1	3	GND
4	4' FUTAGES	4	SEGA WAVEF SW	4	GND
5	8' SW	5	TRIANG F' OSC1	5	GND
6	16' OSC1	6	F' OSC1	6	GND
7	32'	7	4' FUTAGES	7	GND
8	GND	8	8' SW	8	GND
9	MON OSC1	9	16' OSC1	9	TRIANG
10	+5	10	32' OSC1	10	OUT DCO2
11	+12				
12	-12				

↓
WAVEF
SW
OSC 1
↑

MODEL DS1 DS2	REVISION			
SCHEMA F				
DATE	DRAWN BY	DESIGNED BY	DATE	
	Appach	R. Ravi		

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PIN	REFERENCE J1	PIN	REFERENCE J2
1	+12V	1	2048'
2	GND	2	1024'
3	GND	3	512'
4	+5	4	256'
5	+5	5	128'
6	K	6	64'
7	K	7	32'
8	TA	8	16'
9	TA	9	8'
10	-12V	10	4'
11	GLIDE RATE	11	2'
12	GLIDE RATE	12	1'

MODEL DS1 DS2			REVISION			
SCHEMA F						
DATE	DRAWN BY	DESIGNED BY	DATE			
	<i>Sp. 6.6</i>	<i>R. Brai</i>				

TAVOLA DELLA VERITA' N.1

	32o	16o	8o	4o	2o	1o
FA	0	0	0	0	0	0
FA"	0	0	0	0	0	1
SOL	0	0	0	0	1	0
SOL"	0	0	0	0	1	1
LA	0	0	0	1	0	0
LA"	0	0	0	1	0	1
SI	0	0	0	1	1	0
DO	0	0	0	1	1	1
DO"	0	0	1	0	0	0
RE	0	0	1	0	0	1
RE"	0	0	1	0	1	0
MI	0	0	1	0	1	1
FA	0	0	1	1	0	0
FA"	0	0	1	1	0	1
SOL	0	0	1	1	1	0
SOL"	0	0	1	1	1	1
LA	0	1	0	0	0	0
LA"	0	1	0	0	0	1
SI	0	1	0	0	1	0
DO	0	1	0	0	1	1
DO"	0	1	0	1	0	0
RE	0	1	0	1	0	1
RE"	0	1	0	1	1	0
MI	0	1	0	1	1	1
FA	0	1	1	0	0	0
FA"	0	1	1	0	0	1
SOL	0	1	1	0	1	0
SOL"	0	1	1	0	1	1
LA	0	1	1	1	0	0
LA"	0	1	1	1	0	1
SI	0	1	1	1	1	0
DO	0	1	1	1	1	1
DO"	1	0	0	0	0	0
RE	1	0	0	0	0	1
RE"	1	0	0	0	1	0
MI	1	0	0	0	1	1
FA	1	0	0	1	0	0
FA"	1	0	0	1	0	1
SOL	1	0	0	1	1	0
SOL"	1	0	0	1	1	1
LA	1	0	1	0	0	0
LA"	1	0	1	0	0	1
SI	1	0	1	0	1	0
DO	1	0	1	0	1	1

TAVOLA DELLA VERITA' N.2

	93417 A				93417 M				93417 B				Fattori di moltiplicazione
	0 ₄ 2048	0 ₃ 1024	0 ₂ 512	0 ₁ 256	0 ₄ 128	0 ₃ 64	0 ₂ 32	0 ₁ 16	0 ₄ 8	0 ₃ 4	0 ₂ 2	0 ₁ 1	
FA	0	0	0	0	1	1	1	0	1	1	1	1	239
FA"	0	0	0	0	1	1	1	1	1	1	0	1	253
SOL	0	0	0	1	0	0	0	0	1	1	0	0	268
SOL"	0	0	0	1	0	0	0	1	1	1	0	0	284
LA	0	0	0	1	0	0	1	0	1	1	0	1	301
LA"	0	0	0	1	0	0	1	1	1	1	1	1	319
SI	0	0	0	1	0	1	0	1	0	0	1	0	338
DO	0	0	0	1	0	1	1	0	0	1	1	0	358
DO"	0	0	0	1	0	1	1	1	1	0	1	1	379
RE	0	0	0	1	1	0	0	1	0	0	1	0	402
RE"	0	0	0	1	1	0	1	0	1	0	1	0	426
MI	0	0	0	1	1	1	0	0	0	0	1	1	451
FA	0	0	0	1	1	1	0	1	1	1	1	0	478
FA'	0	0	0	1	1	1	1	1	1	0	1	0	506
SOL	0	0	1	0	0	0	0	1	1	0	0	0	536
SOL"	0	0	1	0	0	0	1	1	1	0	0	0	568
LA	0	0	1	0	0	1	0	1	1	0	1	0	602
LA"	0	0	1	0	0	1	1	1	1	1	1	0	638
SI	0	0	1	0	1	0	1	0	0	1	0	0	676
DO	0	0	1	0	1	1	0	0	1	1	0	0	716
DO"	0	0	1	0	1	1	1	1	0	1	1	0	758
RE	0	0	1	1	0	0	1	0	0	1	0	0	804
RE"	0	0	1	1	0	1	0	1	0	1	0	0	852
MI	0	0	1	1	1	0	0	0	0	1	1	0	902
FA	0	0	1	1	1	0	1	1	1	1	0	0	956
FA"	0	0	1	1	1	1	1	1	0	1	0	0	1.012
SOL	0	1	0	0	0	0	1	1	0	0	0	0	1.072
SOL"	0	1	0	0	0	1	1	1	0	0	0	0	1.136
LA	0	1	0	0	1	0	1	1	0	1	0	0	1.204
LA"	0	1	0	0	1	1	1	1	1	1	0	0	1.276
SI	0	1	0	1	0	1	0	0	1	0	0	0	1.352
DO	0	1	0	1	1	0	0	1	1	0	0	0	1.432
DO"	0	1	0	1	1	1	1	0	1	1	0	0	1.516
RE	0	1	1	0	0	1	0	0	1	0	0	0	1.608
RE"	0	1	1	0	1	0	1	0	1	0	0	0	1.704
MI	0	1	1	1	0	0	0	0	1	1	0	0	1.804
FA	0	1	1	1	0	1	1	1	1	0	0	0	1.912
FA"	0	1	1	1	1	1	1	0	1	0	0	0	2.024
SOL	1	0	0	0	0	1	1	0	0	0	0	0	2.144
SOL"	1	0	0	0	1	1	1	0	0	0	0	0	2.272
LA	1	0	0	1	0	1	1	0	1	0	0	0	2.408
LA"	1	0	0	1	1	1	1	1	1	0	0	0	2.552
SI	1	0	1	0	1	0	0	1	0	0	0	0	2.704
DO	1	0	1	1	0	0	1	1	0	0	0	0	2.864

TAVOLE DELLA VERITA' N° 4

		T.A.
FA	239	-0.62 V
FA"	253	-0.65 V
SOL	268	-0.70 V
SOL"	284	-0.74 V
LA	301	-0.79 V
LA"	319	-0.83 V
SI	338	-0.89 V

DO	358	-0.94 V
DO"	379	-1 V
RE	402	-1.06 V
RE"	426	-1.13 V
MI	451	-1.19 V
FA	478	-1.27 V
FA"	506	-1.34 V
SOL	536	-1.43 V
SOL"	568	-1.52 V
LA	602	-1.61 V
LA"	638	-1.71 V
SI	676	-1.81 V

DO	716	-1.92 V
DO"	758	-2.03 V
RE	804	-2.16 V
RE"	852	-2.29 V
MI	902	-2.42 V
FA	956	-2.56 V
FA"	1012	-2.73 V
SOL	1072	-2.90 V
SOL"	1136	-3.07 V
LA	1204	-3.26 V
LA"	1276	-3.46 V
SI	1352	-3.66 V

DO	1432	-3.88 V
DO"	1515	-4.11 V
RE	1608	-4.36 V
RE"	1704	-4.62 V
MI	1804	-4.90 V
FA	1912	-5.19 V
FA"	2024	-5.50 V
SOL	2144	-5.85 V
SOL"	2272	-6.20 V
LA	2408	-6.57 V
LA"	2552	-6.96 V
SI	2704	-7.38 V

DO	2854	-7.80 V
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Keyboard
Control
Voltages